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Cocotropus richeri, a new species of velvetfish (Teleostei: Aploactinidae) from Lifou, Loyalty Islands

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Abstract

The aploactinid fish *Cocotropus richeri* **n. sp.** is described on the basis of a single specimen from a coral gravel slope ground in 65–116 m depth at Lifou Island, Loyalty Islands, New Caledonia. It is characterised by 2 + 5 = 7 gill rakers, some of them rudimentary; 5 preopercular spines; upper jaw longer than lachrymal length; papillae absent on both posterior portion of upper jaw and outer edge of lower jaw; first sensory pores of lower jaw separated; the anterior tip of the isthmus not reaching forward to level of 5th sensory pore on lower jaw; and the spiny portion of the dorsal fin with a large black blotch which is extending onto the back. A key to the 10 known species of *Cocotropus* is presented.
Keywords: Velvetfishes, Aploactinidae, new species, Loyalty Islands.

Zusammenfassung

Cocotropus richeri **n. sp.** (Aploactinidae) wird von einem Exemplar beschrieben, das auf einem Korallenkiesgrund in 65–116 m Tiefe bei Lifou, Loyalty-Inseln, Neukaledonien gesammelt wurde. Die neue Art ist charakterisiert durch 2 + 5 = 7 Kiemenreusendornen (einige rudimentär), 5 Präoperkulardornen, durch den Oberkiefer, der länger als die Lachrymallänge ist, durch fehlende Papillen sowohl auf dem hinteren Oberkiefer als auch auf dem äußeren Unterkiefer, durch die ersten Sinnesporen der beiden Seiten des Unterkiefers, die voneinander getrennt sind, durch die vordere Spitze des Isthmus, die nicht bis zum Niveau der 5. Sinnespore auf dem Unterkiefer reicht, und durch einen großen schwarzen Fleck auf dem stachligen Teil der Rückenflosse, der sich auch bis auf den Rücken erstreckt. In einem Bestimmungsschlüssel werden die 10 bekannten Arten der Gattung *Cocotropus* unterschieden.

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1 Introduction

The family Aploactinidae is a group of scorpaenoid fishes with the unusual combination of characters of the dorsal fin originating far forward on the cranium, the head invested with knob-like lumps, and the body usually covered with modified, prickly scales (hence, the name velvetfishes) (Poss & Eschmeyer 1978). Though closely related to the Scorpaenidae, aploactinids show a loss of pungent spines. The group was reviewed by Poss & Eschmeyer (1978), and an identification key to genera together with a list of species occurring in the Western Pacific was presented by Poss (1999). The family includes 32 species belonging to 16 genera (Poss & Eschmeyer 1978; Poss & Johnson 1991; Poss 1999). It is confined to the Indo-West Pacific. Several closely related species have been transferred to *Paraploactis* by Poss & Eschmeyer (1978).

Cocotropus Kaup, 1858 (Kaup 1858: 333; type *Corythobathus echinatus* Cantor, 1849 by monotypy), the genus of velvetfishes with the highest species number, is a group of relatively small-sized species characterised by having the gill membranes free from the isthmus, the anus slightly anterior to the anal fin origin, the dorsal fin rays continuous and comprising a single fin, pelvic fin rays I, iii, and the interorbital ridges on both sides nearly running parallel (Poss 1999). *Cocotropus* was recently reviewed by Imamura & Shinohara (2003) who recognised 9 species:

C. altipinnis Waite, 1903 (Waite 1903: 41–43, 44–45, pl. 5, fig. 2, Lord Howe Island; also recorded from Kermadec Islands by Poss 1999: 2356);
C. dermacanthus (Bleeker, 1852) (Bleeker 1852: 268, Wahai/Seram, Indonesia, as *Apistus dermacanthus*; valid as *Cocotropus dermacanthus*, see Poss & Eschmeyer 1978: 405; also Seychelles according to Smith & Smith 1963);
C. echinatus (Cantor, 1849) (Cantor 1849: 1027, pl. 13, Sea of Pinang/Penang, Malaysia, as *Corythobatus echinatus*; valid as *Cocotropus echinatus*, see Poss & Eschmeyer 1978: 405);
C. keramaensis Imamura & Shinohara, 2003 (Imamura & Shinohara 2003: 233–236, figs. 1–3, Kerama Islands/Japan);
C. larvatus Poss & Allen, 1987 (Poss & Allen 1987: 79–82, fig. 1, Marshall Islands, Ryukyu Islands/Japan, Banda Islands/Indonesia, Christmas Island/Australia; also Thailand according to Imamura & Shinohara 2003: 236);
C. masudai Matsubara, 1943 (Matsubara 1943: 470, fig. 156, Hachijo-jima, Izu Islands/Japan; valid according to Poss & Eschmeyer 1978: 405);
C. monacanthus (Gilchrist, 1906) (Gilchrist 1906: 145, pl. 37 bottom, off False Bluff/South Africa, as *Tetraroge monacanthus*; valid as *Cocotropus monacanthus* according to Poss & Eschmeyer 1978: 405; also Comores according to Imamura & Shinohara 2003: 238; also Tanzania);
C. roseus Day, 1875 (Day 1875: 160, pl. 38, fig. 8, Coromandel coast of India; valid according to Poss & Eschmeyer 1978: 405);
C. steinitzi Eschmeyer & Dor, 1978 (Eschmeyer & Dor 1978: 16, fig. 1, N beach, Eilat/Israel; also Andaman Islands).

Species of the genus apparently live on or under coralline gravel on the continental or insular shelf.

During the expedition "LIFOU 2000" in the Baie du Santal, Loyalty Islands, New Caledonia, the R/V "Alis" dredged a single specimen of an undescribed *Cocotropus* from a coral gravel bottom at 65–116 m depth on the steep slope near the northwestern end of the bay. The new species is described herein, because it is likely that additional specimens may not be collected for some time. This brings the number of species in the genus up to 10.

Acknowledgements

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2 Methods

Methods follow ESCHMEYER (1969), except for the counting of bony sensory tubes (including all elements on the line) and measurement of the lachrymal length (from anterior tip of maxilla to posterior tip of second/posterior lachrymal spine) which follows IMAMURA & SHINOHARA (2003). Fin rays are counted using the method of FRICKE (1983). The standard length is abbreviated "SL". The fish collection of the Muséum National d'Histoire Naturelle Paris/France is abbreviated "MNHN".

3 Key to the species of *Cocotropus*

1 First sensory pores of lower jaw fused **2**
– First sensory pores of lower jaw separated **5**
2 Upper jaw longer than lachrymal length; 5 preopercular spines **3**
– Upper jaw shorter than lachrymal length; 4 preopercular spines **4**
3 Papillae on posterior portion of upper jaw present; papillae on outer edge of lower jaw developed; anterior tip of isthmus reaching to level of 5th sensory pore on lower jaw ..... ***C. keramaensis***
– Papillae on posterior portion of upper jaw absent; papillae on outer edge of lower jaw absent; anterior tip of isthmus reaching considerably beyond 5th sensory pore on lower jaw ..... ***C. steinitzi***
4 Papillae on posterior portion of upper jaw present; papillae on outer edge of lower jaw developed; gill rakers 0–1 + 4 = 4–5 ..... ***C. monacanthus***
– Papillae on posterior portion of upper jaw absent; papillae on outer edge of lower jaw absent; gill rakers 2 + 6 = 8 ..... ***C. masudai***
5 Upper jaw longer than lachrymal length; papillae on posterior portion of upper jaw absent **6**
– Upper jaw shorter than lachrymal length; papillae on posterior portion of upper jaw present **8**
6 Preopercular spines 5; total gill rakers less than 13; soft dorsal rays 8–10, last divided ... **7**
– Preopercular spines 4; total gill rakers more than 14; soft dorsal rays 11, last single ..... ***C. echinatus***
7 Papillae on outer edge of lower jaw developed; anterior tip of isthmus reaching to level of 5th sensory pore on lower jaw; gill rakers 3 + 6–9 = 9–12; 1st dorsal fin spine 22–25 % of SL; spiny portion of dorsal fin without a black blotch ..... ***C. larvatus***
– Papillae on outer edge of lower jaw absent; anterior tip of isthmus not reaching to level of 5th sensory pore on lower jaw; gill rakers 2 + 5 = 7; 1st dorsal spine 30 % of SL; spiny portion of dorsal fin with a large black blotch ..... ***C. richeri* n. sp.**
8 Preopercular spines 5; dorsal fin spines 11–13; total gill rakers 9–10 ..... **9**
– Preopercular spines 4; dorsal fin spines 14; total gill rakers 6–8 ..... ***C. roseus***
9 Dorsal fin with 13 spines and 10 soft rays, last ray simple; anterior tip of isthmus reaching to level of 5th sensory pore on lower jaw; gill rakers 0 + 10 = 10; total vertebrae 28 ..... ***C. altipinnis***
– Dorsal fin with 11 spines and 9 soft rays, last ray divided; anterior tip of isthmus not reaching to level of 5th sensory pore on lower jaw; gill rakers 3 + 6 = 9; total vertebrae 26 ..... ***C. dermacanthus***

4 *Cocotropus richeri* n. sp. (Fig. 1)

Material

Holotype: MNHN 2004-0841, 21.4 mm SL; Loyalty Islands, Lifou Island, NW side of Baie du Santal, ESE of Cap Aimé Martin, 20°46′59″S 167°02′56″E – 20°47′13″S 167°03′20″E, bottom of coralline gravel, few boulders, foraminifera, 65–116 m depth; dredge (Drague Waren), 3 hauls; RONALD FRICKE, R/V "Alis" – 21 Nov. 2000, 09:00–11:00 h.

Etymology

This new species is named in honour of Dr. BERTRAND RICHER DE FORGES (Institut de Recherche pour le Développement, Nouméa, New Caledonia), who collected many interesting species of New Caledonian fishes.

Diagnosis

A species of *Cocotropus* with 13 spines and 10 soft rays in the dorsal fin, the last ray divided; 2 spines and 7 soft rays in the anal fin; 13 pectoral fin rays; 2 + 5 = 7 gill rakers (some rudimentary); 5 preopercular spines; the upper jaw longer than the lachrymal length; papillae on both posterior portion of upper jaw and outer edge of lower jaw absent; first sensory pores of lower jaw separate; the anterior tip of the isthmus not reaching forward to level of 5th sensory pore on lower jaw; and the spiny portion of the dorsal fin with a large black blotch which is extending onto the back.

Description

D XIII, ix, 1; A II, vii; P_1 9, iv (total 13); P_2 I, iii; C (ii), vii + vii, (ii). Gill rakers 2 + 5 = 7, some of them rudimentary. Bony sensory tubes on lateral line 10.

Head length 35.8 % of SL. Snout length (preorbital length) 10.3 % of SL, 28.7 % of head length. Orbit diameter 7.9 % of SL, 22.2 % of head length. Interorbital ridges on both sides nearly running parallel (Fig. 1B). Lachrymal length 12.6 % of SL, 35.3 % of head length. Upper jaw length 14.0 % of SL, 39.2 % of head length. Papillae absent from outer edge of upper jaw and posterior portion of lower jaw. First sensory pores of lower jaw separated (Fig. 1C). Position of anterior tip of isthmus not reaching to 5th sensory pore. Relative length of upper jaw (U) and lachrymal (L) is U > L. Interorbital width 8.6 % of SL, 24.2 % of head length. Body depth 30.6 % of SL. Body width 14.0 % of SL. Back and sides of body covered with numerous prickly scales; distal parts of operculum also covered with prickly scales; remaining parts of head and body without prickly scales (Fig. 1A). Caudal peduncle length 15.2 % of SL. Caudal peduncle depth 9.3 % of SL.

Predorsal length 13.3 % of SL. First dorsal fin high anteriorly. Length of 1st dorsal spine 30.4 % of SL, 2nd dorsal spine 28.0 % of SL, 3rd dorsal spine 22.7 % of SL, 4th dorsal spine 21.4 % of SL. Length of dorsal fin base 82.5 % of SL. Preanal length 66.4 % of SL. Length of 2nd anal spine 13.8 % of SL. Length of anal fin base 25.9 % of SL. Pectoral fin length 29.0 % of SL. Pelvic fin length 22.7 % of SL.

Colour in life. Head and body rose, caudal fin with two brown bands, black blotch on mid of spiny part of dorsal fin reaching onto adjacent back.

Colour in alcohol. Similar to life colouration, but the rose fades to pale whitish.

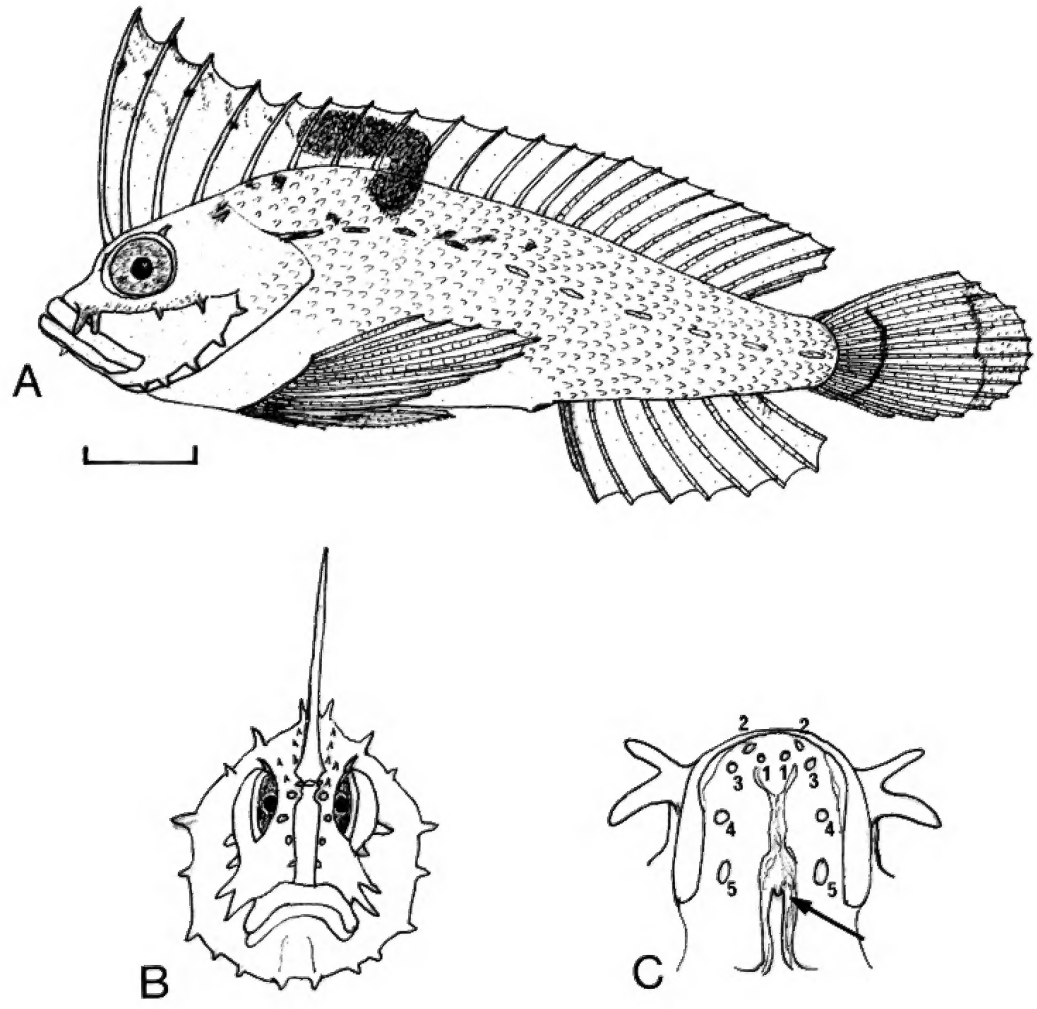

Fig. 1. *Cocotropus richeri* n. sp., holotype, MNHN 2004-0841. **A.** Lateral view; scale indicates 3 mm. **B.** Head, frontal view. **C.** Head, ventral view; arrow indicates anterior tip of isthmus; numbers are attributed to sensory pores of the lower jaw.

Distribution

Cocotropus richeri n. sp. is known only from the type locality in the Baie du Santal, Lifou Island, Loyalty Islands.

Relationships

This new species resembles *C. altipinnis* from Lord Howe and Kermadec Islands and *C. echinatus* from Malaysia in the height of its anterior portion of the dorsal fin (1st spine about 30 % of SL in *C. richeri* n. sp.), but differs from *C. altipinnis* in the upper jaw that is longer than the lachrymal length (shorter in *C. altipinnis*), in the absence of papillae on the posterior portion of the upper jaw and on the outer edge of the lower jaw (present in *C. altipinnis*), in the 2 + 5 = 7 gill rakers (0 + 10 = 10 in *C. altipinnis*), the position of the anterior tip of the isthmus that is not reaching the level of the 5th sensory pore on the lower jaw (reaching the level of the 5th pore in *C.*

altipinnis), and in the presence of a large black blotch on the central portion of the spiny part of the dorsal fin (absent in *C. altipinnis*); it is distinguished from *C. echinatus* in its 13 pectoral rays (11 in *C. echinatus*), the number of gill rakers (5 + 10 = 15 in *C. echinatus*), the 5 preopercular spines (4 in *C. echinatus*), and the position of the anterior tip of the isthmus that is not reaching the level of the 5th sensory pore on the lower jaw (reaching the level of the 5th pore in *C. echinatus*). From other species of the genus, *C. richeri* n. sp. is distinguished by the higher anterior part of the dorsal fin. The new species also differs from *C. larvatus* Poss & Allen, 1987 (Christmas Island to Ryukyu Islands), which is morphologically similar, also in the absence of papillae on the outer edge of the lower jaw (present in *C. larvatus*), the anterior tip of the isthmus not reaching to level of 5th sensory pore on lower jaw (reaching to level of 5th pore in *C. larvatus*), the gill raker count (3 + 6–9 = 9–12 in *C. larvatus*), and the black blotch on the spiny portion of the dorsal fin (absent in *C. larvatus*).

Remarks

The biology of the species of *Cocotropus* is poorly known. Many specimens, however, have been found in crevices of rocky, coral rubble, or coral-lined algae substrata; the holotype of *Cocotropus larvatus* was collected by hand under coral rubble. This may indicate a secretive life of these small-sized fishes. The holotype of *Cocotropus richeri* n. sp. was dredged from a coral rubble slope. It is smaller than most other species of the genus, but this is considered typical for this insular shelf habitat with a low concentration of plankton in the water column. Food may be the limiting factor for fish species living here, and the specimens of several species dredged from this habitat were considerably smaller than those of closely related species from other areas like Grande Terre/New Caledonia.

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